A Design Approach to the Study of People's Experiences with Technologies in the context of Public Transport

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Relevant to the study of people's attitudes towards public transport use is the consideration to the role of technology as part of the travel experience. Technologies aim to enhance daily tasks but tend to change the way people interact with products and can be perceived as difficult to use. This is critical in the context of 'public use' where products and services are to be used by the population at large: adults, children, elderly, people with disabilities, and tourists. From different perspectives, the topic of users and the use of technologies has been studied from the Social Sciences and Human Computer Interaction fields; however, earlier approaches fail to address the way in which experiential knowledge informs people's interactions with products and technologies, and how such information could guide the design of future technologies. This paper describes a pilot study, part of a larger ongoing exploratory research that investigates people's experiences with infrastructure, systems and technologies in the context of public transport. The methodological approach included focus groups, field observations and retrospective verbal reports. At this stage this study found that four context led factors were the primary source of reference informing participants' actions and interactions; these are: (i) context -> experience, (ii) context -> interface, (iii) context -> knowledge, (iv) context-> emotion.

Keywords
Experiential Knowledge, Context of Use, People-technology Interactions, Public transport technologies

Introduction

Transport systems represent 25% of the world's energy consumption and carbon dioxide emissions (World Energy Council 2007). Thus, increasing the use of public transport (PT) has the potential to contribute significantly to sustainability and a better quality of life. With policy-makers and researchers exploring various strategies to facilitate the uptake of public transport in Australia (Hensher 1998), enhancing our understanding of the diverse range of factors that contribute to transport choices is essential. To date, research in the Australian context suggests that despite increasing concerns about sustainability and urban congestion, the majority (86%) of Australian adults report that they never use public transport (ABS 2009). Transport in Australia is dominated by the automobile, only 14% of the population regularly use public transport and 4% walk or cycle. Reasons reported by PT non users range from: lack of service, preference to the comfort of a private car, travel times, and other aspects such as: safety issues, reliability, cost, and socialisation (ABS 2009). In addition, Public discourses on PT use in newspapers commentary and blogs tend to focus on quality of service and infrastructure, lack of information or knowledge about the system, and orientation and simplicity (or ease of use). An emergent element in this public discourse is the reference to the use of technologies in public contexts to access information and pay for services.

Technologies aim to enhance daily tasks but tend to change the way people interact with products and can be perceived as complex and difficult to use. This is critical in the context of public use where products and services are implemented to be used and accepted by the population at large: adults, children, the elderly, people with disabilities, and tourists. Devising improvements requires understanding the point of view of public transport system users and to integrate it into the planner and policy maker perspective (Dziekan 2008).

This paper reports on an empirical pilot study investigating people's perception of the technologies present in their PT experience in the city of Brisbane (Australia). The observation of people's interactions with technologies aims to gain further understanding of their experiential knowledge and the contextual issues informing their actions, thus, enhancing our understanding of factors contributing to people's transport choice. It is expected that this research direction will lead to the identification of future opportunities for sustainable transport design, planning and policy.

Public transport use, the role of technology and the user's experience

The conventional approach for the development of public transport planning and strategies is focused on infrastructure and pricing. However, people's processes and rationale for choosing public transport remain under explored. Further, extant knowledge needs to be updated and re-contextualised in line with increasing pervasiveness of Information and Communication Technologies (ICT) hardware and software that plays a role in the connections achieved through travel. What are the interactions between people, the physical environment and technologies embedded in a public transport travel experience? and how can this experience be enhanced in order to increase and motivate sustainable use of public transport?

In the last two decades, research in transport shows unanimity that a substantial switch from automobiles to public transport would contribute to substantial environmental, economic, and social benefits (Brown, et al. 2003; Mackett and Edwards 1998; Andreassen 1995). Within this view it has been identified that: reducing traffic congestion, serving the city centre, improving the environment, stimulating development and improving the city's existing public transport system are the primary drivers for the implementation of public transport technologies, thus, they have been adopted as 'first principles' supporting the macro rationale for the decision making policy for transit infrastructure implementation (Mackett and Edwards 1998). However, this approach ignores important contextual features that have impact on user transport choice, for example technologies that support mobile working. In this respect it has been said that new technologies that allow for greater flexibility are changing conventional cost and time based transport analysis. (Banister 2008)

In more recent studies conducted to understand public transport on a 'micro' and personal level it is shown that: user attitude (Bates et al. 2001; Brown et al. 2003) perception, satisfaction and expectation (Andreassen 1995) are the major contributing factors to transit behaviour and choice. Such studies also identified that the primary barriers affecting user perceptions and attitudes of public transport are: reliability, variability, fare cost, travel time, and comfort (Bates et al. 2001; Beirao and Cabral 2003). Of these, reliability is presented as the key concern for users as it creates uncertainty. Uncertainty has been documented as a main concern during a number of activities associated with public transport including arrival wait time, travel time, regularity, and final destination (Bates et al. 2001). 'Uncertainty' presents a strong determination of the user's perception and of the user public transport experience. This is the case of travellers comparing the actual and the displayed scheduled time of arrival of a transport service. Upon viewing a discrepancy between the displayed and actual time of arrival the user interprets the service as unreliable, thus forming a psychological experience which results in a barrier determining user behaviour and attitude (Brown et al. 2003). Would technological solutions be sufficient to address users' uncertainty and promote better attitude to public transport?

Relevant to the study of user perceptions and attitudes towards public transport use is the consideration to the role of technology as part of the travel experience. Possible impacts of information technologies on transport include diminishing the need to travel as many activities can be done remotely (e.g.: work). This view does not attempt to

understand how technology shapes society and, how reductions in one set of transport related activities (e.g. the journey to work) could lead to increases elsewhere as the car is now available during the day for other uses (e.g. for shopping and social activities) or for other users. In view of the role of technology and its pervasiveness in all types of daily life activities, understanding people's perceptions and attitudes to public transport also requires understanding what constitutes a public transport journey activity and what the experience of the user is. The literature indicates that further consideration is required to understand how technology may affect individual behaviour and its impact on PT (Banister and Hickman 2006).

Studies in the topic of user and technologies are situated within the scope of the fields of information technology, human-computer interaction, technology adoption, and socio technical-change (Oudshoorn and Pinch 2003). Documented research within those areas is mainly concerned with what technology can do, technology obsolescence, users' role in the development of technology, and user-technology relations where the connection between users and technology is more about society's technological development. An issue not addressed in earlier approaches is the way in which users' experiential knowledge informs interactions with products/technologies, and how to bring such information during the early stages of a product design process. This paper reports an exploratory pilot study that investigates the interactions between people, the physical environment and technologies present in a public transport travel experience with the aim of gaining further understanding of the experiential and contextual factors informing people's transport choices.

The study

An empirical pilot study was conducted to investigate and gain further insights from public transport users' with technological devices in the context of a public transport journey experience. It focused on people's interactions with technologies supporting diverse transport related activities that take place between departure and destination points; for example: using a ticket vending machine, recharging a travel smart card, finding travel timetable, seeking information or assistance, etc. The pilot study aimed at responding to the following research questions:

- What do people like or dislike about PT? (barriers and incentives)
- What are the interactions between people, the physical environment and technologies embedded in a public transport travel experience? and What kind of experiential knowledge informs their interactions with technologies?

At this stage of the study, the scope is limited to the observation of frequent and infrequent users of public transport services interacting with devices involved in planning the journey, entering and exiting the system; these are: vending machines, information kiosks, smart cards, location maps, and ATM machines.

Research Design

The selected methods aimed to find out how people with different backgrounds and experience use technological designs in public contexts are: screening questionnaire, field observation, and talk aloud protocol with frequent and infrequent users of public transport services. Table 1 presents a summary.

Objective	To investigate: • How do people use technological devices in public transport contexts? • What kind of experiential knowledge informs their interactions with technologies?
Participants	Frequent and infrequent users of public transport
Focus	Observation of people's interactions with technological devices during a public transport journey experience; from departure to destination point.
Data collection methods	• Initial observation: storyboards • Focus groups • Field observations • Retrospective interview
Experiment session	• Stage 1: (a) Initial observation (b) Focus groups in lab environment • Stage 2: (c) field observations (d) retrospective interviews

Table 1. Research design summary

This study's focus on experiential knowledge follows an earlier investigation that found that experience underlies all kinds of human knowledge and it is context-dependent; people's experience with a particular social, cultural and physical context-of-use determines how they interact with products (Chamorro-Koc et al. 2008).

Data collection process

As presented in Table 1, this process comprised: (a) Initial observation, (b) Focus group, (c) Field observation, and a (d) Retrospective interview. Participants were frequent and infrequent PT users in urban Brisbane and were invited by email sent to all academic and administrative staff at the Gardens Point campus of Queensland University of Technology in Brisbane (Australia). The invitation included a short screening questionnaire that was employed to assist in the grouping of the participants (infrequent and frequent) for the focus group sessions. Eight participants (and the facilitator) partook in each focus group session. Participants for the field observation (n=3) had also participated at the focus group sessions and volunteered to it when the researcher presented the invitation during the focus group session. The following subsections describe each part of the data collection process.

The researcher's initial observation

An initial observation around Brisbane's Central Business District (CBD) main bus and train stations was conducted and documented with photographs. Visuals were collated into storyboards to gather the researcher's view on the contextual factors and people's use of technology for the pilot study:

Figure 1. Storyboards from the researcher's observation of Brisbane CBD Train Central Station

The focus group sessions

Focus group sessions were organised around two groups of participants: frequent and infrequent users of public transport. The sessions aimed to explore users perception of technologies embedded in current public transport. To assist participants evoke the technologies, flash cards with photographs of the current technologies were presented to them. These flash cards were numbered for ease of identification during data analysis.

The facilitator of the focus group sessions prompted participants with two questions: What travel mode do you employ on a regular basis? What do you like and dislike about the technologies you find during your public transport journey? The purpose of the focus group session was to identify problem areas and to flesh out the type of user-product interactions that take place. The one hour focus group sessions followed a semi-structured discussion format covering participants views and experience of PT, particularly their interaction with the public transport system, technologies (ticketing machines, online journey planner, transport cards), and the existing infrastructure (accessibility, seating, lighting, information displays). Flash cards were used to stimulate discussion, with participants asked to sort them into two groups: the ones that they like and dislike (Figure 2).


Figure 2. Participants discussing and sorting out flash cards during a focus group session

The field observations
Field observations focused on users of public transport services, and their interaction with the devices involved in: planning the journey, entering and exiting the system, and those utilised for supporting tasks during this activity (e.g. vending machines, location maps). Field observation sessions were organised on a one-on-one basis: participant-researcher. This required participants to be followed during a routine journey activity in a designated public context-of-use. The researcher follows the participant throughout the activity and the participant is asked to talk aloud while interacting with the devices. The researcher audio records his or her observations as well. The aim of field observations is to further understand the problem areas identified from focus group sessions, where technology affects travel performance.

The retrospective interviews
Retrospective interviews took place immediately after field observations aiming to gain further insights from people's experiences. The purpose of this is to confirm the researcher's observations and to identify difficulties and appreciations encountered by participants when making use of current technologies. To assist in debriefing participants, videos and audios from the observation are shown to as prompts for participants to further describe the sequence of events, difficulties found, and appreciation of the technologies employed in his or her experience of technological devices.

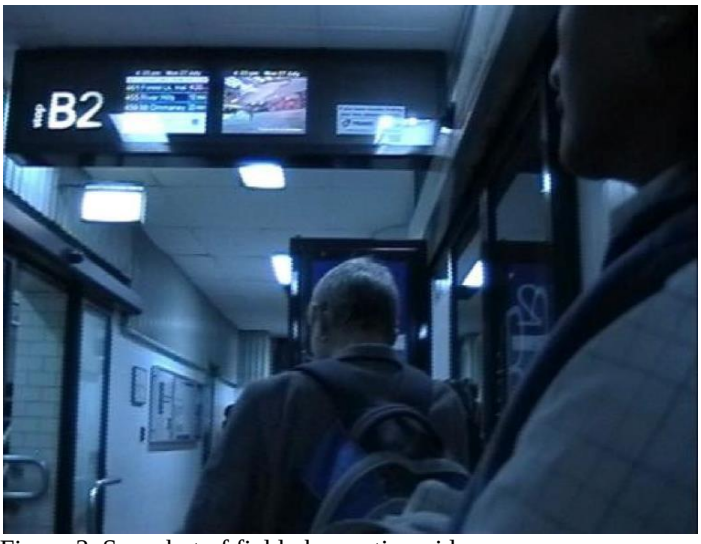

Figure 3. Snapshot of field observation video

Figure 3 depicts a moment during a field observation where a participant interacts with a visual display (bus timetable). The researcher followed the participant during a daily life type of journey and recorded his or her interactions with technology embedded in the public transport service of choice. Observations helped identify the participant's perception of the ease of use of the technology, the contextual aspects informing his or her travel activities, and his or her previous knowledge or familiarity with the technology.

Data analysis and Results

The analysis process and identification of results aimed at gaining further insights on what do people like or dislike about PT, and understanding the kind of experiential knowledge that informs people interactions with technologies in a public context of use

Verbal protocols from the focus group session and the think aloud process captured in the video recordings of field observations were transcribed for the analysis process. Initial thematic analysis of those transcriptions was conducted to identify themes related to the users' engagement within the public transport system, technologies and infrastructure. The flash card grouping done by the participants during the focus group sessions showed that some images prompt more responses than others. From the participants' flash card groupings and from transcripts of the focus group discussion, experiential and contextual aspects of the user-product interaction with technologies in public contexts of use were identified.

Verbal protocol from focus groups and field observations were transcribed and a thematic analysis approach to analyse both video recorded data and transcriptions was adopted to identify major themes. This initial stage identified three themes encapsulating seven categories which were prominent with regard to the users' experience and interaction within public transport systems, technologies and infrastructure. The main three themes are: variable (identification of type of transport and user categories), people-technology interaction (comprising context, experience and knowledge categories), and perceived experience (defined by action and perception of use categories).Table 2 shows a summary of the coding system.

Following coding a qualitative analysis was conducted to identify links between categories and how they impacted on the users' engagement with public transport infrastructure and technologies. The use of Atlas.ti specialised software for qualitative analysis, assisted the identification of overlaps and relationships between categories..

Category		Code	Description
Variable	Type of transport	Tt	Mode train
		Tb	Mode bus
		Tf	Mode ferry
	Type of user	Uf	User frequent
		Ui	User infrequent
People-technology interaction	Context (of use)	CS	Context social
		CE	Context built environment
		CT	Context time
	Experience	ED	Episodic experience (a memory)
		IEC	Individual experience within context
		ES	Experience of 'seeing' (or familiarity)
		E0	Experience – none (100% unfamiliar)
		Ep	Experience positive
		En	Experience negative
	Knowledge	IU	Intended use of feature/product
		PBC	Principle based concept – knows principles of how the device work (general purpose)
Perceived experience	Actions	As	Action successful
		Au	Action unsuccessful
	Perception of use	PU	Positive use (easy, unproblematic, reliable)
		NU	Negative use (difficult, unreliable)

Table 2. The coding system

From the focus group session, the particular coding example presented in Figure 4 shows that a participant disliked the interaction with two devices represented on the flashcards (the ticket vending machine and the journey planner) and also that this participant is an infrequent user of public transport. In this case, the coding applied was: user infrequent (Ui),

individual experience (of doing) within context (IEC), a perception of something that is unreliable (NU).

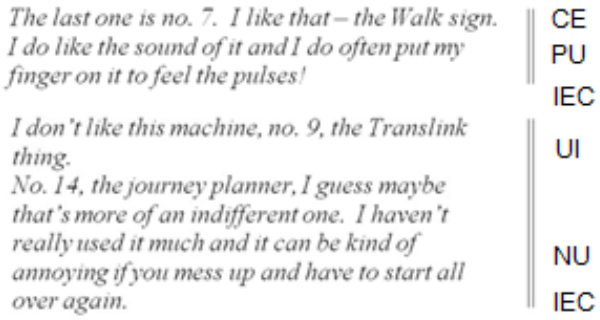

Figure 4: Exemplar of the coding applied to a segment of a focus group session

Coding of verbal protocols from field observations were supported with images from video recordings of the observations. This allowed the researcher to code the transcriptions by relating what the participants said with the actions they were performing. In Figure 5 the participant relates to her experience as frequent user (Uf) and to her experience of taking this bus on daily basis (IEC). Her comments reveal that she uses references to the social context (CS) to inform her knowledge of the timetable of this particular bus route. She understands the technology (visual display in Figure 3) which she finds reliable (PU), but does not use it often as she knows the bus schedule very well. In general, the analysis revealed that the information participants used to inform their 'actions' (or interactions with technology during a public transport journey) came from three main sources: 'previous experience', relating to a users past experience of an action; 'context', relating to the immediate environment and how this informs the users actions; and 'technology, relating to the users engagement with technology to inform their action. The analysis identified a strong connection between context and action.

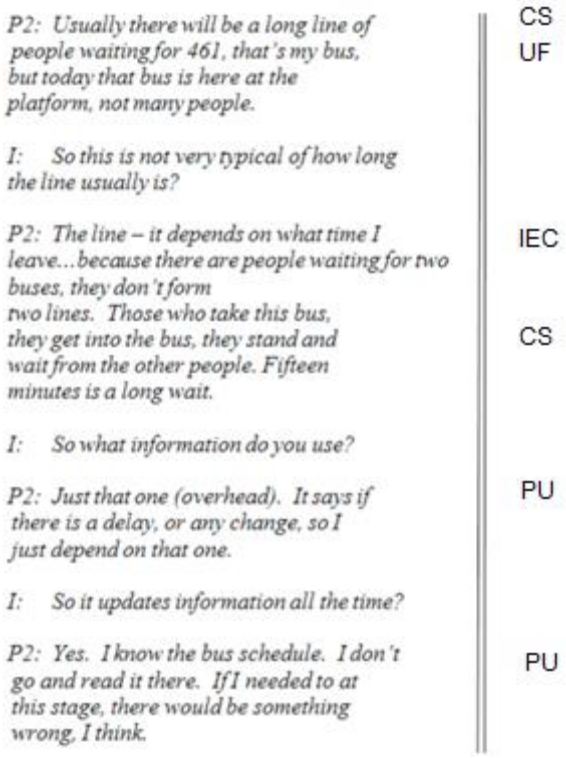

Figure 5. Exemplar of the coding applied to a segment of an interview

The thematic coding revealed that participants primarily informed their actions based on immediate contextual factors than on their previous experience. Coding clusters illustrate that when describing their interactions with public transport infrastructure and emerging technologies participants would reference the context situation or environment to base their action on. These indicate that familiarity, previous experience and knowledge of the situation and environmental context are catalysts to participants' actions.

Results from focus group sessions

These results address the question about what do people like or dislike about PT and identify factors that contribute to people's perceptions of barriers and incentives to the use of PT. The analysis indicate that participants, who were PT users had made a conscious decision to use public transport to commute to work, primarily due to cost and convenience factors. From a cost perspective, commuting by car was not a cost-effective option because of the high-cost of inner city parking. From a convenience perspective, high and unpredictable traffic levels mean that public transport (especially the train) was generally perceived as a quicker, more reliable and less-stressful commuting option. Some participants described how, as one car households, they simply had to utilise public transport - the following quotes typify responses: "*If I knew it was going to be peak hour, trains were easier because the roads block up a lot*", and "*I wouldn't pay for parking but I also don't have access to a car. My husband needs to use the car. We just have one car*".

As regular users of public transport, participants felt that two of the biggest barriers to increased uptake and utilisation were infrequency and unreliability. The following paragraphs summarise results from the focus group sessions into: barriers to uptake, motivating use, users' appraisal of technologies in place, the hidden smart-card reader, and the challenges of bus travel.

In terms of *'r**eliability***, many participants described the annoyance of waiting for delayed buses, which was a relatively common occurrence with the following quotes typical: "*Of waiting and waiting and waiting when I go home in the evenings. It's very disheartening, I suppose….these days, it's happening at least once or twice a week. The traffic is slowly getting worse and worse and worse"*.

The need of ***'motivating use'*** emerged as a general agreement that people needed to be pushed into utilising public transport. More services, reliability and more information were the issues highlighted. *"They need to do something to push people into public transport, like if driving a car is going too slow for you, too bad, get on some public transport*".

Regarding '***users' appraisal of technologies'*** in PT, participants were very critical of the systems and technological infrastructure, describing how they needed accurate, real time information and the ability to individually customise it. The following excerpts describe their experiences and need for better information online and at site: *"I like the real time information, that's useful to me, what's happening. I have the power"; "Talking about journey planning, for example, if you look at this journey planner, it gives you the basic things that you need but you can't customise it for your mobile phone".*

The ***'hidden' smart-card readers***: Participants all agreed that there were several major flaws with the current go-card readers. First, they were extremely difficult to find, especially when the area was busy. There was a general feeling that larger 'tag here' signs were needed, to prompt experienced users through the process and guide new users: "*Just what someone was saying, about not knowing where the ticket machines were. When you are an occasional traveller, you feel the pressure of people's eyes on you when you don't know what you're doing"*

Participants related to the '***challenges of bus travel'***: *"I travel by bus to work five times a week. It generally takes half an hour unless the traffic is really bad in which case it can take up to 45 minutes one way…. five or ten years ago the journey only took 20 minutes. Now it takes 30 minutes and when school starts back it can take 45 minutes. And I'm only travelling six kilometers..."* Notably, for non-regular bus users, the bus journey was viewed as a 'scary' experience: *I don't like about buses and I guess this is partly due to my novice or occasional use in that I often don't know which bus stop or where to go, and am I at the right bus stop, and you're trying to work out your bus number and then identify the bus stop and then you try to see if your bus is coming or not."*

In general, results revealed that in general, underlying issues contributing to a user liking or disliking a technology in a public context of use are: the time required for interaction, mental effort demanded by the technology, and type of feedback received.

Results from field observations

The analysis from field observations and retrospective interviews was useful to gain further insights about on people's use technological designs in public contexts and to explore the kinds of experiential knowledge informing their interactions with technologies. As described in the previous section, participant observations and responses to the retrospective interviews were coded using Atlas.ti. The analysis of field observations employed the coding scheme shown in Table 2. Overall, outcomes from the analysis highlighted that familiarity and contextual information are the main sources informing people's interactions with technologies.

Field observations revealed that in general participants did not rely very heavily on technology provisions within the public transport context; rather they referenced prior knowledge, or familiarity with the system and context to inform their actions. The type of contextual information that participants related to, depended heavily on the particular context in which the action was taking place. For example, Participant 1 actions demonstrated a strong connection between the context and her previous experience of the public transport infrastructure. She identifies 'regular commuters' at her stop and use their presence or absence as information source to known if her bus had arrived or not: *"Often I use the people at the bus stop in the queue to know whether it's been or not. So if I can see regulars at the bus stop, I know that it's okay to hang around."* This participant described the references she employs from her knowledge of regular commuters and familiarity of the

journey context to prompt her interaction with transport technology. She said: *"I don't usually have to press the bell. There are regulars who push it, always the same one, allows people to get off at my stop, and someone tends to press it before I think to do it. At a time in the journey, if it hasn't been pressed by a set of lights just before I'm about to get off, that's when I know to press it."*

Similarly Participant 3 provided information about her public transport journey based on her knowledge of the infrastructure and everyday route:

> ***P3:*** *...you know that after 3 o'clock, there's one express bus, after 4 o'clock how many – it's just practice."*
> ***Question:*** *So you don't really rely on any technology to inform you about the bus services?*
> ***P3:*** *No, not during peak hours. Between 7 and 9, and 4 and 6, I won't bother. If I'm at work and I'm leaving after 6.30, I'll check rather than stand around, and I'll check online. Other than that, I'll just wander out, because there's always something coming."*

Participants' descriptions of their interactions with technology and the perceived usability, familiarity and previous experience were found to play an important role in the participants' perceptions and responses toward emerging technologies such as the Go Card. *"I always use my Go Card. At first when it came out, it was a bit of an effort to remember to take it out of my bag but now I'm quite used to it. I use that all the time unless I haven't to top it up and, if I haven't topped it up, it might take a few weeks for me to remember."*

The qualitative analysis from field observations identified a strong connection between context (situation) and action. Outcomes illustrate that users -when describing their interactions with public transport infrastructure and emerging technologies - would reference the context situation or environment to base their action on. Context was also found to occur concurrently with references to familiarity indicating that familiarity, previous experience and knowledge of the situation and environmental context are catalyst to users' actions. For example, Participant 2 encountered a problem with the technology display and based on previous knowledge of a similar situation, the context and the particular technology, the participant was able to readjust the intended action and catch another bus: *"...last time I knew that there was a mistake, myself and another woman also knew that there was a mistake with that light because we saw that bus pulling out. So we knew there was something failing in the technology, but usually what I watch is how many minutes more for the bus, more than the colour, so if it's, for example, three minutes for the next bus, like yesterday, there were 53 minutes I was early, so I went to the next bus stop and took a slow bus, rather than standing and waiting. So that technology helps in that way: to make up your mind to stand or walk."*

Similarly Participant 3 demonstrated a strong knowledge of the context (situation) which she was able to use to identify alternative actions based on what is occurring in the environment. *"I'll wait for a 196 and if a 196 doesn't come and I get cranky, but if we notice a 116 coming, we'll run down to the next bus stop. We'll always make it because it gets caught at the lights so we'll get across while it's stopped at the red light. I've done it many times."*

Knowledge of the context (situation) was also identified as a key factor that assisted users in deciding on the most appropriate and enjoyable journey and to address their personal situation requirements. This is demonstrated by Participant 1 reference to her contextual knowledge about public transport options.

> ***Question:*** *Does the train go close to your house?*
>
> ***P1:*** *It would probably be a five minute drive, but I've never really been a train catcher. I've always preferred the bus... there are a few buses I can catch. I always try to catch this one because I have a really heavy bag and it's only a five minute walk away. So if I miss it, it's quite disappointing. The city is only a five or ten minute walk but it makes a big difference."*

Discussion

In general, the analysis revealed that participants' interactions with technology during a public transport journey are informed from three main sources: 'previous experience' (the user's past experience of an action); 'context' (the immediate environment and users' individual situation); and 'interaction with technology' (the users' engagement with devices). Results from focus group sessions indicate that improvements in infrastructure and services at a meta level do not translate into a satisfactory experience of PT. At the individual level, dissatisfaction (annoyance, and lack of guidance) with uncertainty and complex aspects of PT (on schedule, capacity, connectivity) lead users to require improvements such as: accuracy of time table, real-time feedback, and customization. Results from field observations identified an evident connection between context and action issues, where familiarity and prior knowledge are the determinant factors.

The pilot study found that contextual factors were the primary source of reference to inform participants' actions and interactions with public transport infrastructure and technologies. Four are the identified context relationships so far: (i) context -> experience, (ii) context -> interface, (iii) context -> knowledge, (iv) context-> emotion. The first refer to the social context, where presence of other 'regular PT users' provides confirmation on various aspects of the PT experience

(bus timetable, waiting time). Similarly, the second connection refers to context informing about the need (or no need) to interact with a particular interface. It uses reference to the presence of other 'regular PT users' allow them to adopt specific roles, for example: the person who rings the bell to get off at a particular bus stop, the person who hails for the bus, the person who do not interact with the required interface to stop the bus and expect other to do it. The third refer to the context of time and of infrastructure (individual route) informing knowledge about the convenience or not of taking PT at certain time/place, and about possible alternatives. Finally, the fourth connection refers to the use of other references to context to decide for more enjoyable ways of travel.

Findings enhance our understanding of people's choices during their transport journeys. These findings suggest that consideration to the four context led relationships can inform the development of services and design solutions for public transport technologies. Further studies into each one of the four relationships is needed to explore potential ways in which this knowledge can be made accessible for designers and stakeholders in a more suitable for the early stages of a design process.

These findings contribute to the extant knowledge in the area of context of use. The study of context has been addressed in various areas of design and human computer science. Dourish (2004) summarises that there are two notions of context: a technical and a social. The technical notion of context considers a static framework in which human action is seen in relation to the computational system supporting it. From a social perspective, the context of people's activities draws from their everyday cultural and common-sense understandings of the nature of the world. It is influenced by the individual's motivations, knowledge and cultures. Thus, context arises from the activity itself. In this study, context encompasses both technical and social dimensions, both informing people's activities and choices during a PT journey. This is described by the four context-led relationships identified from this pilot study.

Findings also contribute with further insights into particular aspects of other studies found in the literature. For example, this study's context-led relationships can be related to extant knowledge about the notion of the Familiar Stranger in urban settings. Defined as 'individuals that we regularly encounter but do not interact with', this concept also refers to the existence of relationships or connections with those familiar strangers in public spaces (Paulos and Goodman 2003). This study's identification of the four relationships offers relevant insights into how some of those connections are formed during emerging interactions between people, and between people and technologies taking place in public contexts.

Conclusions

This paper has described a pilot study that explored context aspects and experiential knowledge of people's interactions with technologies during their PT journeys. This empirical pilot study identified four context-led relationships: (i) context -> experience, (ii) context -> interface, (iii) context -> knowledge, and (iv) context-> emotion. Results of the study at this stage are indicative due to the study's limitations: number of participants in field observations and the transport mode chosen by them. Although indicative, these four context-led relationships that emerged from the rich qualitative data collected at focus groups, field observations and retrospective interviews, can potentially inform the future development of solutions that support people's engagement with public transport.

Results from this study contribute to enhance our understanding of the factors influencing people's transport choices and experiences. Consideration to context-led relationships can inform and assist stakeholders in the identification of design opportunities to support more frequent use of PT. Further research is required into each of the context-led relationships in order to support the development of solutions that enhance people's engagement with PT with implications for sustainable transport design, planning and policy.

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